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IRRIGATION DEVELOPMENT IN IRAQ

(Previous reference: M.E. (O) (47) 3 of January 16th, 1947.)

I.

It will be recalled that Mr. F. F. Haigh was appointed by the Iraq Government early in 1946 as head of a British Irrigation Development Commission, which was to undertake a comprehensive survey of irrigation, water storage, flood control and land drainage possibilities, and draw up plans for construction works for the Iraq Government. The Commission has now completed a general survey of these possibilities, and drawn up detailed plans for the first stage of development, i.e. the construction of water storage works. The final report has yet to be written but a preliminary report has been presented by Mr. Haigh which describes the results of the Commission's investigations.

Irrigation Development Programme.

2. The total area at present served by irrigation in Iraq is about 6,800,000 acres. The works proposed aim at extending this area by the addition of about 9 million acres. The total cost is estimated at £113. millions, divided as follows:-

Flood control and storage	£25.4 million
Irrigation development	£36.5 "
Drainage	£40.2 "
Power	£ 7.8 "
Navigation	£ 3.0 "
Total	£113.0 million

With population of some 4 millions Iraq is not at present over-populated. Development of irrigation and power resources must therefore necessarily take place gradually, and in step with the growth of the population and the mechanisation of agriculture. The Irrigation Commission considers that the full development outlined above is unlikely to be required before the end of the century. Spread out over this period, the cost would involve an average annual expenditure of about £2. million only. Meanwhile, the immediate needs are flood control, limited irrigation development and drainage in the old irrigated areas. On this basis the Commission has recommended a programme of works for the next ten years involving an expenditure of £24,200,000 or £2,420,000 per annum (see part II below). Work on the first stage of the Euphrates project is already in hand. The Commission's recommendations for the Tigris have now been studied by the Consulting Engineers who have recommended an alternative combination of works which would be rather more expensive. Their recommendations are summarized in Part II below. When the Iraq Government has taken a decision as between these recommendations and those of Mr. Haigh, it is hoped that the first stage of the works will be put in hand without further delay.

Finance:

3. The Commission anticipates that a large proportion of the capital expenditure will be recovered from the increase in land values resulting from the works, and that revenue sufficient to make the various projects productive will be obtained. They have submitted detailed proposals to the Iraq Government for a taxation system to cover the cost of the works, involving the levying of taxes on urban property, irrigated land and the crops produced. Meanwhile the Iraqi Prime Minister has made a preliminary request to the International Bank for a loan of £11,250,000 to meet part of the cost of the first ten year programme. International Bank experts are now visiting Iraq but it is considered most unlikely that they will agree, at this stage, to recommend that the Bank should advance more than a very small proportion of this sum.

Future of the Commission:

4. The Haigh Irrigation Commission is now being disbanded, although Mr. Haigh himself, with a nucleus of British engineers, is remaining in Iraq until the end of June. It is hoped that the Iraqi Government will then agree to prolong Mr. Haigh's contract until early in 1950 in order to enable him to write up and publish his conclusions in detail. It is also hoped that a Development Branch of the Irrigation Department will now be set up under a British irrigation engineer whose functions would be:-

(a) To continue the work of the Commission in planning the construction of smaller storage works, distribution works, and land drainage, and

(b) To keep alive and interpret to the Iraq Government the work of the Commission.

II.

The British Irrigation Commission's latest report, dated the 20th December, 1948, may be summarised as follows:-

(1) Water Storage Works:

Euphrates

5. (a) The Commission has drawn up detailed plans and designs for the development of the existing flood control works at the Habbaniyeh lake. This development should ensure flood control of the river and will provide water for the irrigation of about 2 million acres. The estimated cost of the works is £3,375,000. The work is planned to proceed in two stages, the first stage, which would cost £2 millions and would provide irrigation water for 750,000 acres, has already been put in hand and could, it is estimated, be completed in two years;

(b) Additional flood control and water storage can be provided by the construction of a reservoir utilising the Abu Dibbis and Bahr-al-Milh depressions. This project has not yet been surveyed in detail but a preliminary investigation indicates that its cost will be about £2 million and that it will provide irrigation water for 750,000 acres.

Tigris:

6. A number of alternative projects and combination of projects for water storage on the Tigris have been examined. As a result, the Commission has now recommended to the Iraq Government

(c) that the Wadi Tharthar project should be developed as the main flood control and water storage reservoir for the Tigris. (See M.E. (O)(47)3, paragraph 5). This project, which can be carried out by stages, involves the construction of a barrage across the Tigris at Samarra and of long inlet and outlet channels. The first stage, which will provide for flood control only, is estimated to cost £7 million. The second stage will cost an additional £7½ million, and, in conjunction with the Gibraltar and Dokhan dams described below, will provide irrigation water for over 6 million acres. It is considered that this project will alone ensure complete flood control of the Tigris and its tributaries except on rare occasions. The Commission recommends that, to make flood control complete and also to provide additional irrigation water, the Wadi Tharthar project would be supplemented by:

(d) A dam at the Gibraltar site on the Diyala. This project has been prepared in detail and is estimated to cost £2,530,000;

(e) A dam at Dokhan on the lesser Zab. Plans for this project are being drawn up. It is estimated that it will cost about £3 million.

(11) Irrigation Development.

7. In addition to the water storage works described above, the development of irrigation involves the construction of distribution works, i.e. canals and their appertinent works. Detailed designs for these distribution works have not yet been prepared. In the absence of such designs the cost of these works which will provide for the irrigation of about 9 million acres, is roughly estimated as follows:

Euphrates extensions:	£10.5 millions
Lesser Zab extensions:	£ 4.00 millions
The Ishaqi, Diyala and Nahrwan areas	£8.35 millions
Lower Tigris areas	£13.75 millions
T o t a l	£36.5 millions

(3) Drainage.

8. In Iraq, experience has shown that drainage is essential it the productivity of irrigated lands is to be maintained. Without it irrigated lands are liable to become saline or waterlogged. The Commission has, therefore, strongly recommended that all areas both of existing irrigation and new development should be provided with an adequate drainage system. Several small drainage schemes have been worked out in detail and from these a gross rate has been calculated. The total cost is estimated as follows:-

Old irrigated area requiring drainage:	3.41 million acres
	£11 millions.
New irrigated area:	9 million acres;
	£9.2 millions
Total	£20.2 millions

(4) Hydro-electric power:

9. The power development possibilities of the development scheme outlined in paragraph I above are small, since economical water storage requires low dams which result in little and expensive power. The quality of power which it is estimated can be produced at each site and the appropriate cost (including construction of power station, generating plant and transmission are as follows:

Sites	Power K.W.	Cost
Wadi Thárthar	66,000	£4,500,000
Gibraltar Dam	15,000	£1,350,000
Dokhan dam	40,000	£2,000,000
T o t a l	121,000	£7,850,000

(5) Navigation:

10. The Commission has recommended that certain small regulating works should be undertaken on the Lower Tigris in order to permit the maintenance of navigation at all times with the use of very little water. These works have not been worked out in detail. The total cost might be about £3 millions.

Plan at Works for the next ten years:

The Commission has recommended the following plan of works for the next ten years:-

Storage works:	Cost
Completion of Habbaniyah project - stage I	£2 million
Completion of Wadi Tharthar project - stage I	£7 million
Construction of Gibraltar dam on the Diyala	£2,580,000
Drainage in old areas at a rate of £500,000 p.a.	£5,000,000
Irrigation Development:	£7,623,000
T o t a l	£24,209,000

Consulting Engineers' Report

12. The Iraq Government's Consulting Engineers, Messrs. Coode, Vaughan-Lee, Frank and Gwyther, have examined the Commission's recommendations for the Tigris in conjunction with Sir William Halcrow and partners. They consider that there are strong technical objections to the use of the Wadi Tharthar depression for irrigation storage, since the high water levels involved would impose a heavy strain on the long length of embankment required and constitute a grave danger to Baghdad. They have now, therefore, recommended that the Wadi Tharthar project should be carried out for flood control only, at an estimated cost of six and one-half million pounds and that a project, rejected by the Haigh Commission, for a dam on the Greater Zab at Bekhme should be undertaken for irrigation storage at an estimated cost of 9 million pounds. This dam might be supplemented later by the construction of further dams on the Lesser Zab and the Diyala. Mr. Haigh has now written a further paper in which he endeavors to dispel the consulting engineer's fears about the development of the Wadi Tharthar and it remains to be seen which opinion the Iraq Government will accept.